

May 30, 2002

MEMORANDUM TO: Theodore R. Quay, Chief  
Equipment and Human Performance Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation

FROM: David C. Trimble, Chief */RA/*  
Operator Licensing and Human Performance Section  
Equipment and Human Performance Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE APRIL 19, 2002, PUBLIC MEETING TO DISCUSS  
THE DEVELOPMENT OF A PROPOSED WORKER FATIGUE RULE

On April 19, 2002, the staff held a public meeting to discuss the development of a rule that will assure that personnel performing safety-related functions at nuclear power plants are not impaired by fatigue. Participants in the meeting (see Attachment 1) included representatives from the Electric Power Research Institute (EPRI), the Nuclear Energy Institute (NEI), the Professional Reactor Operator Society (by teleconference), the Union of Concerned Scientists, individual utilities, and members of the public. The meeting agenda is contained in Attachment 2. The staff, in responding to a request from the last public meeting, provided an overview of the proposed rulemaking option and a briefing on the research findings which could serve as the basis for hours of service or rest thresholds. The staff's presentation materials are provided as Attachment 3.

Following the staff presentation, Col. Gregory Belenky, M.D., Walter Reed Army Institute of Research, provided an overview of factors affecting sleep and performance, particularly sleep deprivation. He discussed many of his physiological research findings which generally show that the effects of fatigue are independent of the work environment and task to be accomplished and that there are individual differences in the reaction to fatigue. Dr. Belenky's presentation materials are provided as Attachment 4. Following Dr. Belenky's presentation the staff presented a summary of a proposed rulemaking approach submitted by the Union of Concerned Scientists in a letter dated February 25, 2002, and a "strawman" concept developed by the staff for establishing work hour thresholds. Robert Evans (NEI) and Bryan Dolan, industry representative, then discussed the development of a proposed comprehensive program to address the concerns of worker fatigue. The program will be developed by an NEI task force composed of utility representatives and staff members from NEI, EPRI, and INPO. The task force plans to present the status of their development efforts at the next meeting.

In light of the NEI proposal to develop a guidance document, the meeting departed from the planned agenda for the afternoon session to allow participants to prepare a list of potential issues to be addressed by the proposed industry program and identify desired program

characteristics. This list is provided as Attachment 5. The items were derived from the discussions, comments, and recommendations expressed by one or more of the participants. The groupings were suggested during the discussion but are not meant to prescribe the final document.

The participants set Wednesday, June 5, 2002 as the date for the next public meeting to discuss the rulemaking. The industry task force agreed to provide a presentation at the next meeting on the development of draft guidelines for managing worker fatigue in the nuclear industry.

Attachments: As stated

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Accession Number:

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NAME	DRDesaulniers	DCTrimble	TRQuay
DATE	05/28/02	05/29/02	05/30/02

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Public Meeting to Discuss Development of a Proposed Rule Concerning  
Worker Fatigue at Nuclear Power Plants

April 19, 2002

Attendance List

NAME	AFFILIATION
Steve Turren	Professional Reactor Operator Society
Robert Meyer	Professional Reactor Operator Society
Gregory Belenky	Walter Reed Army Institute of Research
Roger Rosa	NIOSH, CDC
Dave Lochbaum	Union of Concerned Scientists
Craig K. Seaman	APS-PV
James Davis	NEI
Bryan Dolan	Duke Energy
Ned Tyler	Constellation Energy
James Gallman	TXU
David Shafer	Amergen UE
Patrick Shaffer	SCE
Robert Evans	NEI
Marty Birch	HSIAC/Booz Allen
Rob Wilson	HSIAC/Booz Allen
David Desaulniers	NRC
Gerald Ellis	Exelon
David Ziebell	EPRI
Sandra Frattali	NRC
William Dean	NRC
Clare Goodman	NRC
Darrel Drobnich	National Sleep Foundation
Deann Raleigh	US Sciencetech
Tom Poindexter	Winston and Strawn

NAME	AFFILIATION
Jerry McMahon	AEP-Cook Nuclear
J. Persensky	NRC
David Trimble	NRC
Martin Humphrey	FENOC
Garmon West	NRC
Richard Eckenrode	NRC
James Bongarra	NRC
Kathryn Barber	NRC
Chip Cameron	NRC

Public Meeting to Discuss Development of a Proposed Rule Concerning  
Worker Fatigue at Nuclear Power Plants

April 19, 2002

Agenda

Morning Session

8:30 - 8:45	Introductions and Opening Remarks
8:45 - 9:15	Policy Assessment Overview
9:15 - 10:15	Overview of Fatigue Research Relevant to Threshold Discussion
10:15 - 10:30	Break
10:30 - 11:00	NEI White Paper Presentation
11:00 - 11:30	Q&A
11:30 - 12:30	Lunch

Afternoon Session

12:30 - 12:40	Staff Concept for Thresholds
12:40 - 12:50	UCS Proposal
12:50 - 1:00	Practical Scheduling Constraints and Concerns
1:00-1:45	Threshold Development Break-out Session
1:45-2:00	Break
2:00-2:30	Presentation from Break-out Sessions
2:30-3:00	Consensus and Items for Resolution
3:00-3:30	Future Meetings and Assignments

## **Meeting Participant Recommendations for Development of NEI Guidelines for Managing Fatigue in the Nuclear Industry**

### **Guiding Criteria**

The guidance should be:

- Workable
- Enforceable
- Clear
- Effective
- Efficient
- Practical
- Simple
- Consistent with the Science
- Designed to Prevent Abuse

The guidance should:

- Promote consistency
- Contain a nexus to safety

### **Scheduling**

Scheduling guidance should address:

- Thresholds
- Work time
- Off time
- Short term scheduling
- Long term scheduling
- The definition of "nominal" workweeks
- Acute/Chronic fatigue
- Breaks
- Turnover
- Planned outages vs normal operation

Scheduling guidance should account for:

- Circadian Effects
- Emergency Situations

Scheduling guidance should protect against:

- Continuously working near the threshold
- Abuse of overtime

## **Policy**

Policy should promote:

- Consistency across stations
- Prevention of abuse by worker and management

Policy should describe:

- Scope of coverage (positions, plant status)
- Mitigation strategies
- Actions to take if thresholds need to be exceeded
- Types of assessment necessary when threshold need to be exceeded (worker/task)
- Corrective Action Plan metrics
- Reporting requirements
- Root cause analysis methods to account for fatigue factors (circadian rhythm, shift length)
- Management of Sleep Disorders/EAP

Policy should allow for:

- Self-declaration
- Flexibility (Longer Time Off Between Shifts)

## **Education and Training**

Training should address:

- Mitigation Strategies
- Fatigue and Alertness Strategies
- Sleep Hygiene/Habits (Strategies for Shift Workers)
- Sleep Disorders
- Effects of Diet and OTC Drugs
- Circadian effects
- Continuous Behavioral Observation
- Expectations/Change Management/Abuse

Training should be provided to:

- Staff
- Management (including top management)
- NRC Inspectors

## **Other Strategies**

Regulatory Framework Needs to be Flexible to allow for:

- Additional data
- Results of Research Become Available
- New Technologies and New Science/Data

Possibility of a Pilot Program

Performance monitoring and data gathering for ongoing program evaluation